



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/916,000	07/26/2001	Warren G. Williamson	0315-000508	1121

27572 7590 05/06/2003

HARNES, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

EXAMINER

KERNS, KEVIN P

ART UNIT	PAPER NUMBER
----------	--------------

1725

DATE MAILED: 05/06/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/916,000

Applicant(s)

WILLIAMSON, WARREN G.

Examiner

Kevin P. Kerns

Art Unit

1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings (Figures 3-8) are objected to because reference number 71 (vertical parting line in Figure 3, but unlabelled in Figures 4-8), is drawn entirely along the vertical axis, although molten metal should flow through the lower portion this region 71. The regions through which molten metal would flow should be shown as a connecting space through 71. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1, 2, 4-6, 24-26, 32, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lebold et al. (US 5,201,811).

Lebold et al. disclose a method and apparatus for the manufacture of complex cores, in which a vertically parted mold having two halves, each defining patterns and impressions of a volute turbo-charger housing, is used to surround a complex core defining imprint (involute) surfaces that further comprise mandrels with removable segments (abstract; column 1, lines 62-68; column 2, lines 1-27 and 65-68; column 3, lines 1-68; column 4, lines 1-68; and Figures 1-7). The molten metal pouring basin communicates with a sprue comprising a gate (aperture) with a J-shaped backsplash design defined in at least one of the side patterns, into which pattern(s) the involute impression is imprinted (Figures 1-7). One of ordinary skill in the art would have recognized that the vertically parted mold halves would readily be made of materials that include either metal and sand, as the use of sand molds are conventional in the art. It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416. The method and apparatus of Lebold et al. are advantageous for producing a complex core while reducing assembly time and labor, with improved thermal cracking resistance (column 2, lines 16-27).

5. Claims 8-11, 16-19, 28-30, 34, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lebold et al. (US 5,201,811) in view of Mohla et al. (US 5,390,723).

Lebold et al. disclose the elements of claims 1 and 24 above. Lebold et al. do not disclose a fusible plug.

However, Mohla et al. disclose a method of treating casting metals, in which a vertically parted mold assembly containing a sprue and runner (gating) system encloses a series of molding cavities therein (abstract; column 3, lines 62-68; column 4, lines 1-16; and Figures 1-4). The sprue contains a consumable (fusible) plug assembly comprised of a steel disc-shaped member (abstract; column 1, lines 51-58; column 2, lines 28-39; column 3, lines 22-30; column 5, lines 18-44). One of ordinary skill in the art would have recognized that the shapes and sizes of the fusible plug assemblies within the gating system of Mohla et al. would readily be modified to minimize the molten metal turbulence during the pouring process. The features disclosed by Mohla et al. are advantageous for allowing non-turbulent flow of molten metal into the molding cavities while the plug assembly maintains a plugged relationship for a preselected retaining period to allow inclusions to travel to the metal surface (abstract; column 1, lines 51-58; column 2, lines 33-39; and column 4, lines 12-16).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the method and apparatus for the manufacture of complex cores, as disclosed by Lebold et al., by further positioning the fusible plug assembly of Mohla et al. within the gating system, in order to allow non-turbulent flow of molten metal into the molding cavities while the plug assembly maintains a plugged relationship for a preselected retaining period to allow inclusions to

Art Unit: 1725

travel to the metal surface (Mohla et al.; abstract; column 1, lines 51-58; column 2, lines 33-39; and column 4, lines 12-16).

6. Claims 3 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lebold et al. (US 5,201,811) in view of Seidinger (US 4,913,218).

Lebold et al. disclose the elements of claim 1 above. Lebold et al. do not teach the use of a molten metal filter.

However, Seidinger discloses a feeder sprue system for a casting mold, in which a vertically parted mold contains a sprue cup for receiving molten metal, and the feeder contains a notch gate through the core and a filter (abstract; column 1, lines 5-8; column 2, lines 32-64; and Figures 1-3). The region below the filter is further provided with a J-shaped (backsplash) cavity for reducing molten metal flow turbulence (column 2, lines 56-64; and Figure 3). The advantages of the filter and (backsplash) cavity include production of high quality castings at reduced filling times (column 1, lines 43-46).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the method and apparatus for the manufacture of complex cores, as disclosed by Lebold et al., by adding the filter element, as taught by Seidinger, in order to produce high quality castings at reduced filling times (Seidinger; column 1, lines 43-46).

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lebold et al. (US 5,201,811) in view of Seidinger (US 4,913,218), and further in view of Mohla et al. (US 5,390,723).

Lebold et al. (in view of Seidinger) disclose all the elements of claims 1 and 12 above. Neither Lebold et al. nor Seidinger discloses a fusible plug.

However, Mohla et al. disclose a method of treating casting metals, in which a vertically parted mold assembly containing a sprue and runner (gating) system encloses a series of molding cavities therein (abstract; column 3, lines 62-68; column 4, lines 1-16; and Figures 1-4). The sprue contains a consumable (fusible) plug assembly comprised of a steel disc-shaped member (abstract; column 1, lines 51-58; column 2, lines 28-39; column 3, lines 22-30; column 5, lines 18-44). One of ordinary skill in the art would have recognized that the shapes and sizes of the fusible plug assemblies within the gating system of Mohla et al. would readily be modified to minimize the molten metal turbulence during the pouring process. The features disclosed by Mohla et al. are advantageous for allowing non-turbulent flow of molten metal into the molding cavities while the plug assembly maintains a plugged relationship for a preselected retaining period to allow inclusions to travel to the metal surface (abstract; column 1, lines 51-58; column 2, lines 33-39; and column 4, lines 12-16).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the method and apparatus for the manufacture of complex cores, as disclosed by Lebold et al., and adding the filter element, as taught by Seidinger, and by further positioning the fusible plug assembly of

Art Unit: 1725

Mohla et al. within the gating system, in order to allow non-turbulent flow of molten metal into the molding cavities while the plug assembly maintains a plugged relationship for a preselected retaining period to allow inclusions to travel to the metal surface (Mohla et al.; abstract; column 1, lines 51-58; column 2, lines 33-39; and column 4, lines 12-16).

8. Claims 7 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lebold et al. (US 5,201,811) in view of Menningen (US 2,919,479).

Lebold et al. disclose the elements of claims 1 and 24 above. Lebold et al. do not teach the use of shell molds or a hollow core therein.

However, Menningen discloses a shell mold comprised of a plurality of mold elements defining multiple mold cavities and a core (column 1, lines 10-13 and 62-69; column 2, lines 29-31; column 3, lines 18-24; and Figures 1, 3, and 4). The hollow core acts as a sprue having conduits for directing molten metal from the core into the mold cavity (column 3, lines 22-24; and Figure 1). The shell mold is resin bonded (column 1, lines 41-45). This shell mold is advantageous for preventing detrimental flash on surfaces (column 2, lines 8-28).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the vertically parted mold assembly disclosed by Lebold et al., by using the shell mold with a plurality of mold elements, as taught by Menningen, in order to prevent detrimental flash on surfaces (Menningen; column 2, lines 8-28).

9. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lebold et al. (US 5,201,811) in view of Seidinger (US 4,913,218), and further in view of Menningen (US 2,919,479).

Lebold et al. (in view of Seidinger) disclose the elements of claims 1 and 12 above. Neither Lebold et al. nor Seidinger discloses the use of shell molds or a hollow core therein.

However, Menningen discloses a shell mold comprised of a plurality of mold elements defining multiple mold cavities and a core (column 1, lines 10-13 and 62-69; column 2, lines 29-31; column 3, lines 18-24; and Figures 1, 3, and 4). The hollow core acts as a sprue having conduits for directing molten metal from the core into the mold cavity (column 3, lines 22-24; and Figure 1). The shell mold is resin bonded (column 1, lines 41-45). This shell mold is advantageous for preventing detrimental flash on surfaces (column 2, lines 8-28).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the vertically parted mold assembly disclosed by Lebold et al., and adding the filter element, as taught by Seidinger, and further by using the shell mold with a plurality of mold elements, as taught by Menningen, in order to prevent detrimental flash on surfaces (Menningen; column 2, lines 8-28).

10. Claims 20-22 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lebold et al. (US 5,201,811) in view of Fisher et al. (US 5,033,531).

Lebold et al. disclose or suggest the elements of claims 1 and 24 above. Lebold et al. do not teach the adhesive, inoculant, and graphite aspects of the fusible plug assembly.

However, Fisher et al. disclose an iron casting method and mold for which a filter member in the flow cavity has a plurality of cells that contain an inoculant, such as graphite (abstract; and column 2, lines 63-66). The cells of the filter may be coated with a first layer of an adhesive and a second layer of particulate inoculant (column 3, lines 20-25 and 63-68; and column 4, lines 1-2 and 29-51). These features are advantageous for reducing casting inclusions (column 4, lines 47-49).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the method and apparatus for the manufacture of complex cores, as disclosed by Lebold et al., by adding the filter member with a plurality of inoculant-containing cells, as taught by Fisher et al., in order to reduce casting inclusions (Fisher et al.; column 4, lines 47-49).

11. Claims 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lebold et al. (US 5,201,811) in view of Mohla et al. (US 5,390,723), and further in view of Fisher et al. (US 5,033,531).

Lebold et al. (in view of Mohla et al.) disclose the elements of claim 34 above. Neither Lebold et al. nor Mohla et al. discloses the adhesive, inoculant, and graphite aspects of the fusible plug assembly.

However, Fisher et al. disclose an iron casting method and mold for which a filter member in the flow cavity has a plurality of cells that contain an inoculant, such as graphite (abstract; and column 2, lines 63-66). The cells of the filter may be coated with a first layer of an adhesive and a second layer of particulate inoculant (column 3, lines 20-25 and 63-68; and column 4, lines 1-2 and 29-51). These features are advantageous for reducing casting inclusions (column 4, lines 47-49).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the method and apparatus for the manufacture of complex cores, as disclosed by Lebold et al., and positioning the consumable (fusible) plug assembly taught by Mohla et al., and by further adding the filter member with a plurality of inoculant-containing cells, as taught by Fisher et al., in order to reduce casting inclusions (Fisher et al.; column 4, lines 47-49).

Response to Arguments

12. The examiner acknowledges the applicant's amendment after final (paper #9) and request for continued examination (paper #12), received by the USPTO on February 24, 2003 and March 24, 2003, respectively. New drawing objections have been cited in paragraph 1 above. Claims 1-38 remain under consideration in the application.

13. Applicant's arguments filed February 24, 2003, have been fully considered but they are not persuasive.

With regard to the applicant's arguments on page 4 of the amendment after final (paper #9), the applicant has argued that the Lebold et al. reference lacks a core having a gate in the form of an aperture. The examiner respectfully disagrees, as the vertically parted mold halves (side patterns) define the pouring basin with a gate in the form of an aperture (see paragraph 4 above), in which the aperture is interpreted as the same structure as the gate (i.e. entrance to the cavity defining the complex core just below the mold half openings 48 and 50 of Figures 4 and 5). Regarding the backsplash limitation of independent method claim 34 (as well as in dependent apparatus claims), the shape of the core entrance (gate/aperture) is generally J-shaped and defines a backsplash, which is viewed as any structure that deflects splashing of a liquid at an acute angle from which the liquid is poured.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Daussan et al. reference is also cited to show related art.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin P. Kerns whose telephone number is (703) 305-3472. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for

Art Unit: 1725

the organization where this application or proceeding is assigned are (703) 305-7718 for regular communications and (703) 305-6078 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

KPK

kpk

April 30, 2003



ALEXANDRA ELVE
PRIMARY EXAMINER